an actuator combined with a motor and comprising a source of actuator current energizing said windings to generate a radial force which stabilizes the position of said spin axis and dampens movements of said rotor and disc.

68 3. (New) An apparatus as claimed in claim 67 wherein said first winding of said motor means is wound over a stator having a plurality of slots with each winding being wound about one of said slots.

69 4. (New) An apparatus as claimed in claim 67 wherein said windings comprising at least first and second phase windings, which are separately wound and separately energized to generate two radial forces.

70 5. (New) An apparatus as claimed in claim 69 wherein said motor includes a stator having a plurality of slots said winding being would over two of said slots.

71 6. (New) An apparatus as claimed in claim 69 including circuit means for separately energizing each of said phases in order to modify the magnitude and direction of said radial force.

72 7. (New) An apparatus as claimed in claim 71 including first and second probes associated with said rotor to measure a gyroscopic motion of said rotor or said shaft, output of said probes being processed to establish a signal applied to energize said first and second phase windings and stabilize said system.

73 8. (New) An apparatus as claimed in claim 72 including means for adjusting the direction of said correction force relative to a reference direction corresponding to the position of said probes.

74 9. (New) An apparatus as claimed in claim 73 including means for modifying the magnitude of said current applied to said first and second phases to adjust the magnitude of the correction force applied to said rotor.

75 10. (New) An apparatus as claimed in claim 74 including a comb filter responsive to the output of said probe to separate components that are synchronous with the speed of said motor of said rotating system from components that are not synchronous with said motor speed and represent oscillatory movements of said rotor to be dampened.

76 ~~11~~. (New) Apparatus as claimed in claim ~~10~~ 75 wherein said actuator current and said drive current are separately applied in time to said windings.

77 ~~12~~. (New) Apparatus as claimed in claim ~~11~~ 76 wherein said actuator current and said drive current are simultaneously applied to said windings.

78 ~~13~~. (New) An apparatus as claimed in claim ~~6~~ 71 wherein said motor has a slotless winding, and said windings of said actuator are concentric but placed in the same airgap between a core and the rotating magnets of said motor.

79 ~~14~~. (New) An apparatus as claimed in claim ~~6~~ 71 wherein the magnitude of the actuator is a function of the current flowing in the two phases of the actuator where the relationship between the forces and the currents are defined as follows:

$F_x = k_f i_{ph1} \cos(p) + k_f i_{ph2} \sin(p)$

$F_y = k_f i_{ph1} \sin(p) - k_f i_{ph2} \cos(p)$

80 ~~15~~. (New) An apparatus for generating actuator currents for the apparatus of claim ~~6~~ 71, including:

means for generating current signals as a function of rotor position;

means for multiplying said motor function currents by the respective detected forces, and means for summing said generated signals.

81 ~~16~~. (New) An apparatus as claimed in claim ~~2~~ 67 further comprising;

means for sensing movements of said rotor;

comb means for separating non repeating movements from repeating movements of said rotor;

said actuator being responsive to said comb means to stabilize said rotor.

82 ~~17~~. (New) An apparatus as claimed in claim ~~16~~ 81 wherein said actuator comprises first and second phase windings, which are separately wound and separately energized to generate two radial forces in quadrature.

83 ~~18~~. (New) An apparatus as claimed in claim ~~17~~ 82 comprising means for generating a signal defining each of said currents having first and second input signals representing

components of said radial force to be generated, and a third input representing motor position;

memory mans addressed with an argument of a function based on said rotor position for providing a trigonometric function based output based on said position; and

multiplier means responsive to said trigonometric function based output signal and said first and second input signals representing components of said radial force to generate elements of a said signal defining said currents.

84 ~~19~~. (New) An apparatus as claimed in claim ~~18~~ 83 wherein said multiplier means comprises a digital/analog converter having said trigonometric based output signals as one input and one of said first and second signals representing said radial force as another input.

85 ~~20~~. (New) An apparatus as claimed in claim ~~19~~ 84 including means for regularly resetting said signal generating means responsive to a motor driven pulse so that reset is proportional to motor rotational speed.

86 ~~21~~. (New) An apparatus as claimed in claim ~~20~~ 85 including a circuit for incorporating an adjustable phase delay into said means for generating a current defining signal.